LISTING OF THE CLAIMS

The following listing of the claims replaces all prior versions and listings of claims for this application. Within this listing of the claims, claims 2, 50, 54, and 58 are amended.

1. **(Canceled)**

2. **(Currently amended)** A functionalized isoapoptolidin compound ~~comprising~~ consisting essentially of an isoapoptolidin core or a stereoisomer thereof, in which:s

(a) at least one hydroxyl group in the isoapoptolidin core is replaced with a substituent selected from C_1-C_{24} hydrocarbyloxy, C_2-C_{25} acyloxy, C_2-C_{25} haloacyloxy C_2-C_{25} thioacyloxy, C_2-C_{25} thiohaloacyloxy, C_2-C_{25} carbonato, halogenated C_2-C_{25} carbonato, C_2-C_{25} thiocarbonato, halogenated C_2-C_{25} thiocarbonato, carbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups;

(b) at least one 1,3-diene functionality in the isoapoptolidin core is replaced by the product of a Diels-Alder reaction with a dienophile;

(c) at least one carbon-carbon double bond in the isoapoptolidin core is replaced with a carbon-carbon single bond; and/or

(d) at least one 1,2-diol functionality in the isoapoptolidin core is replaced with a cyclic ether.

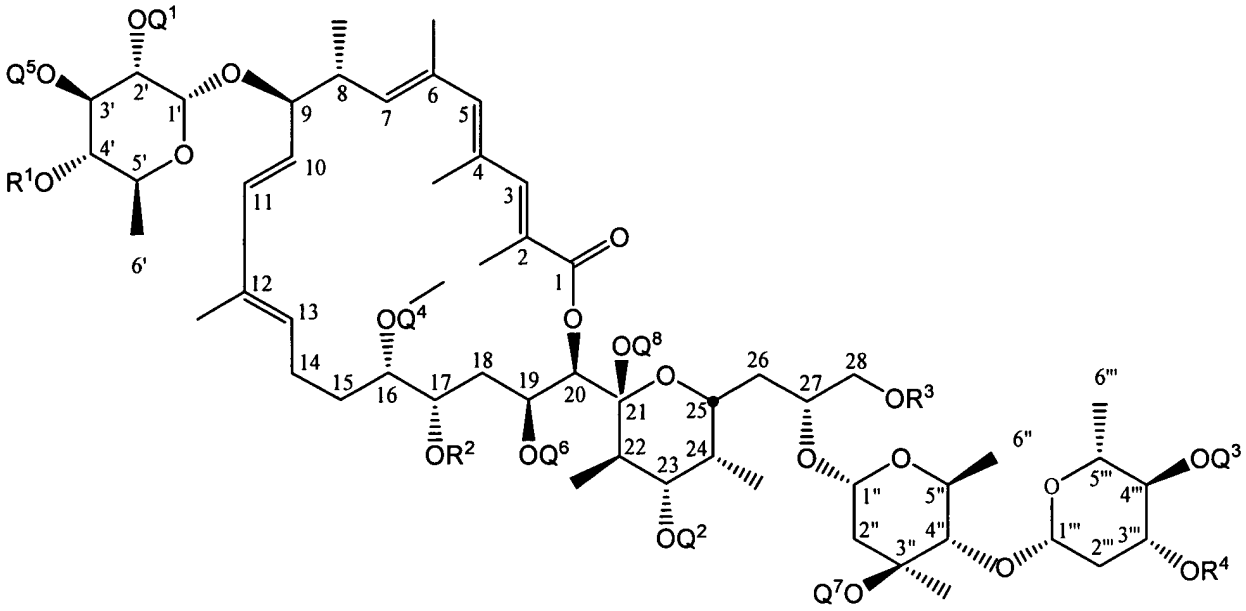
3. **(Original)** The functionalized isoapoptolidin compound of claim 2, in which at least one hydroxyl group in the isoapoptolidin core is replaced with a substituent selected from C_1-C_{24} hydrocarbyloxy, C_2-C_{25} acyloxy, C_2-C_{25} haloacyloxy C_2-C_{25} thioacyloxy, C_2-C_{25} thiohaloacyloxy, C_2-C_{25} carbonato, halogenated C_2-C_{25} carbonato, C_2-C_{25} thiocarbonato, halogenated C_2-C_{25} thiocarbonato, carbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups.

4. **(Original)** The functionalized isoapoptolidin compound of claim 3, wherein the substituent is selected from C_1-C_{12} hydrocarbyloxy, C_2-C_{13} acyloxy, C_2-C_{13} haloacyloxy C_2-C_{13} thioacyloxy, C_2-C_{25} thiohaloacyloxy, C_2-C_{13} carbonato, halogenated C_2-C_{13} carbonato, C_2-C_{13} thiocarbonato, halogenated C_2-C_{13} thiocarbonato, carbamoyloxy, N-(C_1-C_{12} hydrocarbyl)-substituted carbamoyloxy, N,N-di(C_1-C_{12} hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C_1-C_{12} hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C_1-C_{12} hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C_1-C_{12} hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C_1-C_{12} hydrocarbyl)-substituted sulfamoyloxy, (C_1-C_6 alkoxy)methyl ether, (C_1-C_6 alkylthio)methyl ether, and tri(C_1-C_{12} hydrocarbyl)-substituted silyloxy.

5. **(Original)** The functionalized isoapoptolidin compound of claim 4, wherein the substituent is selected from C_1-C_{12} hydrocarbyloxy, C_2-C_{13} acyloxy, and tri(C_1-C_{12} hydrocarbyl)-substituted silyloxy.

6. **(Original)** A compound having the structure of formula (II)

(II)



wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are independently selected from H, C_1-C_{12} hydrocarbyl, acyl of the formula -(CO)-R^5 in which R^5 is C_1-C_{12} hydrocarbyl, and hydroxyl-protecting groups; and

R^1, R^2, R^3, and R^4 are C_1-C_{12} alkyl or H,

or a stereoisomer thereof.

7. **(Original)** The compound of claim 6, having the stereoisomeric configuration of formula (I).

8. **(Original)** The compound of claim 6, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are independently selected from H, C_1-C_6 hydrocarbyl, -(CO)-R^5 wherein R^5 is C_1-C_6 hydrocarbyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are C_1-C_6 hydrocarbyl; and

R^1, R^2, R^3, and R^4 are C_1-C_4 alkyl.

9. **(Original)** The compound of claim 8, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are independently selected from H, C_1-C_6 alkyl, -(CO)-R^5 wherein R^5 is C_1-C_6 alkyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are all methyl or all ethyl; and

R^1, R^2, R^3, and R^4 are methyl.

10. **(Original)** The compound of claim 7, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are independently selected from H, C_1-C_6 hydrocarbyl, -(CO)-R^5 wherein R^5 is C_1-C_6 hydrocarbyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are C_1-C_6 hydrocarbyl; and

R^1, R^2, R^3, and R^4 are C_1-C_4 alkyl.

11. **(Original)** The compound of claim 10, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are independently selected from H, C_1-C_6 alkyl, -(CO)-R^5 wherein R^5 is C_1-C_6 alkyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are all methyl or all ethyl; and

R^1, R^2, R^3, and R^4 are methyl.

12. **(Original)** The compound of claim 6, wherein:

Q^1 is -(CO)-R^5 and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;

Q^2 and Q^3 are -(CO)-R^5 and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;

Q^3 is -(CO)-R^5 and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;

Q^4 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;

Q^5 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;

Q^6 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;

Q^6 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or

Q^8 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

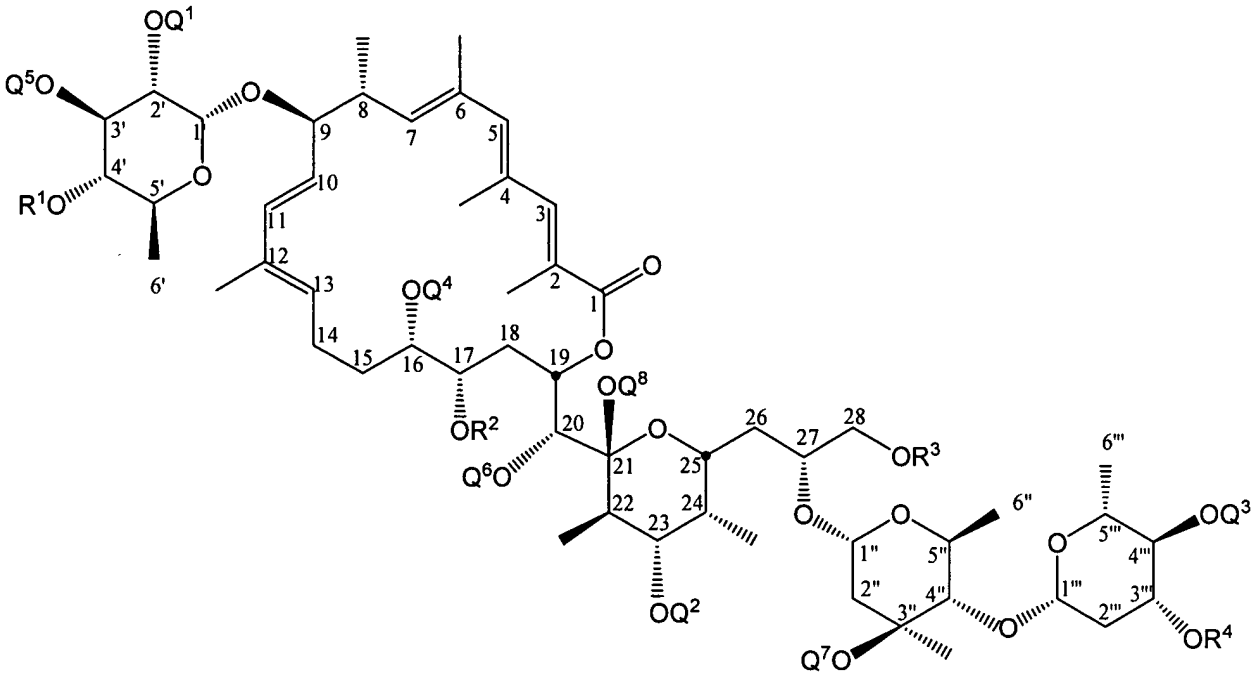
13. **(Original)** The compound of claim 12, wherein:
Q^1 is benzoyl and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^2 and Q^3 are acetyl and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^3 is acetyl and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^4 is acetyl and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;
Q^5 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;
Q^6 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;
Q^6 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or
Q^8 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

14. **(Original)** The compound of claim 7, wherein:
Q^1 is -(CO)-R^5 and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^2 and Q^3 are -(CO)-R^5 and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^3 is -(CO)-R^5 and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^4 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;
Q^5 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;
Q^6 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;
Q^6 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or
Q^8 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

15. **(Original)** The compound of claim 14, wherein:
Q^1 is benzoyl and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^2 and Q^3 are acetyl and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^3 is acetyl and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^4 is acetyl and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;
Q^5 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;
Q^6 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;
Q^6 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or
Q^8 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

16. **(Previously presented)** A compound having the structure of formula (III)

(III)



wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are selected from H, C_1-C_{12} hydrocarbyl, acyl of the formula -(CO)-R^5 in which R^5 is C_1-C_{12} hydrocarbyl, and hydroxyl-protecting groups; and

R^1, R^2, R^3, and R^4 are C_1-C_{12} alkyl or H, with the proviso that at least one of Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 is other than H when R^1, R^2, R^3, and R^4 are methyl and the compound has the stereoisomeric configuration of formula (III),

or a stereoisomer thereof.

17. **(Original)** The compound of claim 16, having the stereoisomeric configuration of formula (III).

18. **(Original)** The compound of claim 16, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are selected from H, C_1-C_6 hydrocarbyl, -(CO)-R^5 wherein R^5 is C_1-C_6 hydrocarbyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are C_1-C_6 hydrocarbyl; and

R^1, R^2, R^3, and R^4 are C_1-C_4 alkyl.

19. **(Original)** The compound of claim 18, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are selected from H, C_1-C_6 alkyl, -(CO)-R^5 wherein R^5 is C_1-C_6 alkyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are all methyl or all ethyl; and

R^1, R^2, R^3, and R^4 are methyl.

20. **(Original)** The compound of claim 17, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are selected from H, C_1-C_6 hydrocarbyl, -(CO)-R^5 wherein R^5 is C_1-C_6 hydrocarbyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are C_1-C_6 hydrocarbyl; and

R^1, R^2, R^3, and R^4 are C_1-C_4 alkyl.

21. **(Original)** The compound of claim 20, wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are selected from H, C_1-C_6 alkyl, -(CO)-R^5 wherein R^5 is C_1-C_6 alkyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are all methyl or all ethyl; and

R^1, R^2, R^3, and R^4 are methyl.

22. **(Original)** The compound of claim 16, wherein:

Q^1 is -(CO)-R^5 and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;

Q^2 and Q^3 are -(CO)-R^5 and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;

Q^3 is -(CO)-R^5 and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;

Q^4 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;

Q^5 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;

Q^6 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;

Q^6 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or

Q^8 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

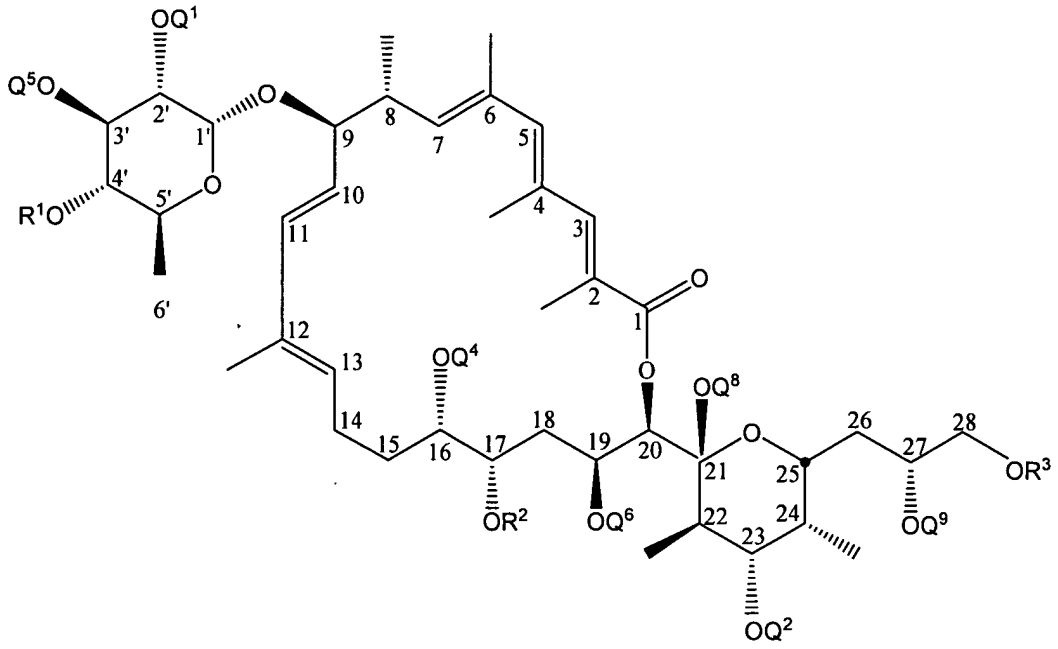
23. **(Original)** The compound of claim 22, wherein:
Q^1 is benzoyl and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^2 and Q^3 are acetyl and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^3 is acetyl and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^4 is acetyl and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;
Q^5 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;
Q^6 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;
Q^6 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or
Q^8 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

24. **(Original)** The compound of claim 17, wherein:
Q^1 is -(CO)-R^5 and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^2 and Q^3 are -(CO)-R^5 and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^3 is -(CO)-R^5 and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^4 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;
Q^5 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;
Q^6 is -(CO)-R^5 and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;
Q^6 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or
Q^8 is C_1-C_6 alkyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

25. **(Original)** The compound of claim 24, wherein:
Q^1 is benzoyl and Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^2 and Q^3 are acetyl and Q^1, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^3 is acetyl and Q^1, Q^2, Q^4, Q^5, Q^6, Q^7, and Q^8 are H;
Q^4 is acetyl and Q^1, Q^2, Q^3, Q^5, Q^6, Q^7, and Q^8 are H;
Q^5 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^6, Q^7, and Q^8 are H;
Q^6 is acetyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H;
Q^6 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^7, and Q^8 are H; or
Q^8 is methyl and Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, and Q^7 are H.

26. **(Original)** A compound having the structure of formula (IV)

(IV)



wherein:

Q^1, Q^2, Q^4, Q^5, Q^6, Q^8, and Q^9 are independently selected from H, C_1-C_{12} hydrocarbyl, acyl of the formula -(CO)-R^5 in which R^5 is C_1-C_{12} hydrocarbyl, and hydroxyl-protecting groups; and

R^1, R^2, and R^3 are independently selected from C_1-C_{12} alkyl and H,

or a stereoisomer thereof.

27. **(Original)** The compound of claim 26, having the stereoisomeric configuration of formula (IV).

28. **(Original)** The compound of claim 26, wherein:

Q^1, Q^2, Q^4, Q^5, Q^6, Q^8, and Q^9 are independently selected from H, C_1-C_6 hydrocarbyl, -(CO)-R^5 wherein R^5 is C_1-C_6 hydrocarbyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are C_1-C_6 hydrocarbyl; and

R^1, R^2, and R^3 are C_1-C_4 alkyl.

29. **(Original)** The compound of claim 28, wherein:

Q^1, Q^2, Q^4, Q^5, Q^6, Q^8, and Q^9 are independently selected from H, C_1-C_6 alkyl, -(CO)-R^5 wherein R^5 is C_1-C_6 alkyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are all methyl or all ethyl; and

R^1, R^2, and R^3 are methyl.

30. **(Original)** The compound of claim 27, wherein:

Q^1, Q^2, Q^4, Q^5, Q^6, Q^8, and Q^9 are independently selected from H, C_1-C_6 hydrocarbyl, -(CO)-R^5 wherein R^5 is C_1-C_6 hydrocarbyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are C_1-C_6 hydrocarbyl; and

R^1, R^2, and R^3 are C_1-C_4 alkyl.

31. **(Original)** The compound of claim 30, wherein:

Q^1, Q^2, Q^4, Q^5, Q^6, Q^8, and Q^9 are independently selected from H, C_1-C_6 alkyl, -(CO)-R^5 wherein R^5 is C_1-C_6 alkyl, and -Si($R^6R^7R^8$) wherein R^6, R^7, and R^8 are all methyl or all ethyl; and

R^1, R^2, and R^3 are methyl.

32. **(Previously presented)** A compound prepared by reaction of the compound of claim 6 with a dienophile, wherein the C-10/C-13 diene functionality is converted to a cyclic group.

33. **(Previously presented)** A compound prepared by reaction of the compound of claim 16 with a dienophile, wherein the C-10/C-13 diene functionality is converted to a cyclic group.

34. **(Previously presented)** A compound prepared by reaction of the compound of claim 26 with a dienophile, wherein the C-10/C-13 diene functionality is converted to a cyclic group.

35. **(Original)** The compound of any one of claims 32, 33, and 34, wherein the dienophile is an N-halosuccinimide.

36. **(Previously presented)** A compound prepared by catalytic hydrogenation of the compound of claim 6, wherein at least one carbon-carbon double bond of the compound of claim 6 is converted to a single bond.

37. **(Previously presented)** A compound prepared by catalytic hydrogenation of the compound of claim 16, wherein at least one carbon-carbon double bond of the compound of claim 16 is converted to a single bond.

38. **(Previously presented)** A compound prepared by catalytic hydrogenation of the compound of claim 26, wherein at least one carbon-carbon double bond of the compound of claim 16 is converted to a single bond.

39. **(Previously presented)** A compound prepared by nucleophilic addition of the compound of claim 6, wherein at least one carbon-carbon double bond of the compound of claim 6 is converted to a single bond.

40. **(Previously presented)** A compound prepared by nucleophilic addition of the compound of claim 16, wherein at least one carbon-carbon double bond of the compound of claim 16 is converted to a single bond.

41. **(Previously presented)** A compound prepared by nucleophilic addition of the compound of claim 26, wherein at least one carbon-carbon double bond of the compound of claim 26 is converted to a single bond.

42. **(Previously presented)** The compound of claim 6, wherein at least one 1,2-diol functionality of the compound of claim 6 is converted to a cyclic ether.

43. **(Previously presented)** The compound of claim 16, wherein at least one 1,2-diol functionality of the compound of claim 16 is converted to a cyclic ether.

44. **(Previously presented)** The compound of claim 26, wherein at least one 1,2-diol functionality of the compound of claim 26 is converted to a cyclic ether.

45. **(Previously presented)** A pharmaceutical composition comprising a therapeutically effective amount of the compound of claims 2, 6, 16, 26 or 58 and a pharmaceutically acceptable carrier.

46. **(Original)** The composition of claim 45, wherein the therapeutically effective amount is a unit dosage and the composition is composed of a unit dosage form.

47. **(Original)** The composition of claim 45, comprising a sustained release formulation.

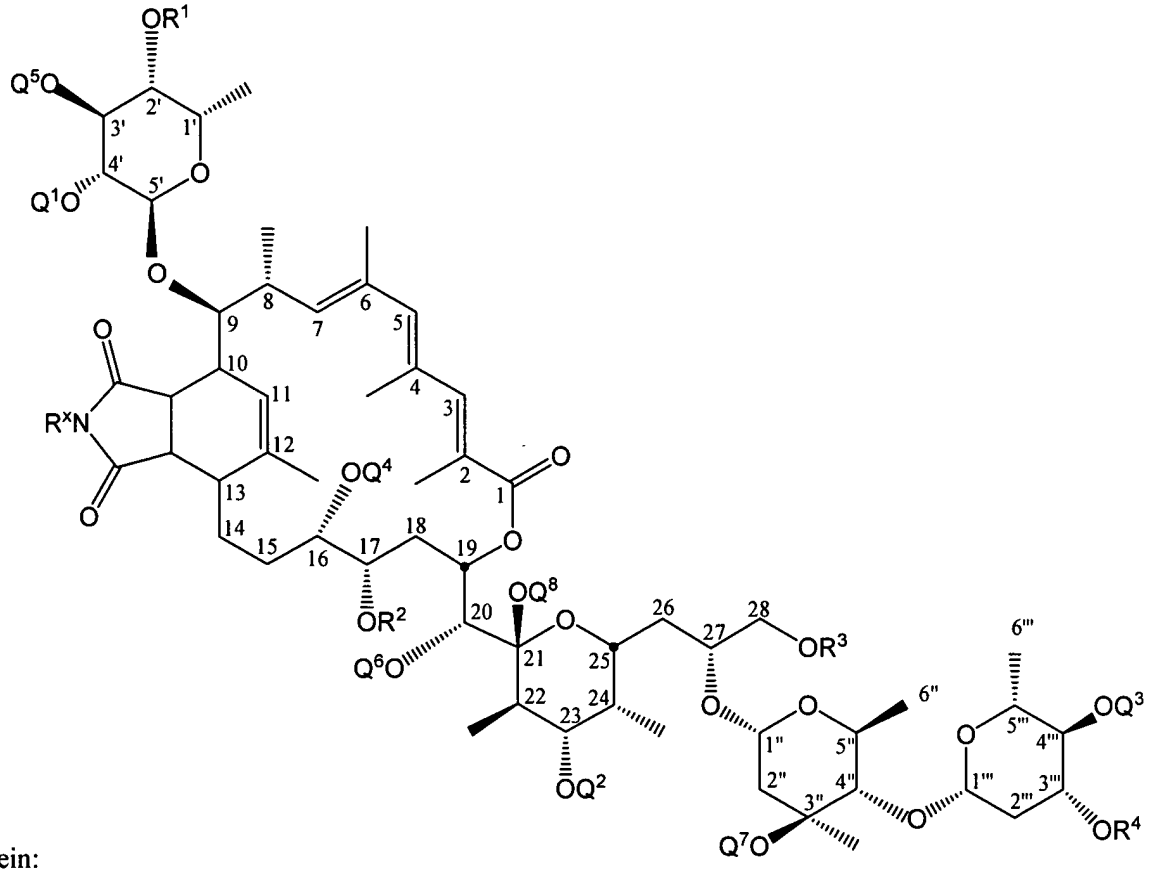
48. **(Previously presented)** A method for inducing apoptosis in cancer cells, wherein the compound of anyone of claims 2, 6, 16, 26, or 58 is administered to the cancer cells.

49. **(Canceled)**

50. **(Currently amended)** A composition of matter ~~comprising~~ consisting essentially of deglycosylated isoapoptolidin in isolated, purified form.

51. **(Original)** A compound having the structure of formula (V)

(V)



wherein:

Q^1, Q^2, Q^3, Q^4, Q^5, Q^6, Q^7, and Q^8 are independently selected from H, C_1-C_{12} hydrocarbyl, acyl of the formula -(CO)-R^5 in which R^5 is C_1-C_{12} hydrocarbyl, and hydroxyl-protecting groups; and

R^1, R^2, R^3, and R^4 are C_1-C_{12} alkyl or H,

or a stereoisomer thereof.

52. **(Previously presented)** The compound of claim 51 oxidatively cleaved at the C-20/C-21 bond.

53. **(Previously presented)** The compound of claim 51 oxidatively cleaved at the C-22/C-23 bond.

54. **(Currently amended)** A functionalized apoptolidin compound ~~comprising~~ consisting essentially of an apoptolidin core in which:

(a) at least one hydroxyl group in the apoptolidin core is replaced with a substituent selected from C_1-C_{24} hydrocarbyloxy, C_2-C_{25} acyloxy, C_2-C_{25} haloacyloxy C_2-C_{25} thioacyloxy, C_2-C_{25} thiohaloacyloxy, C_2-C_{25} carbonato, halogenated C_2-C_{25} carbonato, C_2-C_{25} thiocarbonato, halogenated C_2-C_{25} thiocarbonato, carbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups;

(b) at least one 1,3-diene functionality in the apoptolidin core is replaced by the product of a Diels-Alder reaction with a dienophile;

(c) at least one carbon-carbon double bond in the apoptolidin core is replaced with a carbon-carbon single bond; and/or

(d) at least one 1,2-diol functionality in the apoptolidin core is replaced with a cyclic ether.

55. **(Original)** The functionalized apoptolidin compound of claim 54, in which at least one hydroxyl group in the isoapoptolidin core is replaced with a substituent selected from C_1-C_{24} hydrocarbyloxy, C_2-C_{25} acyloxy, C_2-C_{25} haloacyloxy C_2-C_{25} thioacyloxy, C_2-C_{25} thiohaloacyloxy, C_2-C_{25} carbonato, halogenated C_2-C_{25} carbonato, C_2-C_{25} thiocarbonato, halogenated C_2-C_{25} thiocarbonato, carbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C_1-C_{24} hydrocarbyl)-substituted sulfamoyloxy, and protected hydroxyl groups.

56. **(Original)** The functionalized apoptolidin compound of claim 55, wherein the substituent is selected from C_1-C_{12} hydrocarbyloxy, C_2-C_{13} acyloxy, C_2-C_{13} haloacyloxy C_2-C_{13} thioacyloxy, C_2-C_{25} thiohaloacyloxy, C_2-C_{13} carbonato, halogenated C_2-C_{13} carbonato, C_2-C_{13} thiocarbonato, halogenated C_2-C_{13} thiocarbonato, carbamoyloxy, N-(C_1-C_{12} hydrocarbyl)-substituted carbamoyloxy, N,N-di(C_1-C_{12} hydrocarbyl)-substituted carbamoyloxy, thiocarbamoyloxy, N-(C_1-C_{12} hydrocarbyl)-substituted thiocarbamoyloxy, N,N-di(C_1-C_{12} hydrocarbyl)-substituted thiocarbamoyloxy, sulfamoyloxy, N-(C_1-C_{12} hydrocarbyl)-substituted sulfamoyloxy, N,N-di(C_1-C_{12} hydrocarbyl)-substituted sulfamoyloxy, (C_1-C_6 alkoxy)methyl ether, (C_1-C_6 alkylthio)methyl ether, and tri(C_1-C_{12} hydrocarbyl)-substituted silyloxy.

57. **(Original)** The functionalized apoptolidin compound of claim 56, wherein the substituent is selected from C_1-C_{12} hydrocarbyloxy, C_2-C_{13} acyloxy, and tri(C_1-C_{12} hydrocarbyl)-substituted silyloxy.

58. **(Currently amended)** A composition of matter ~~comprising~~ consisting essentially of isoapoptolidin in isolated, purified form.